इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 3231-1-1 (1986): Electrical Relays for Power System Protection, Part 1: General Requirements, Section 1: Contact Performance [ETD 35: Power Systems Relays]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS : 3231 (Part 1/Sec 1) - 1986

(Reaffirmed 2001)

Indian Standard

SPECIFICATION FOR ELECTRICAL RELAYS FOR POWER SYSTEM PROTECTION

PART 1 GENERAL REQUIREMENTS

Section 1 Contact Performance

(First Revision)

UDC 621·316·925

© *Copyright* 1987

B U R E A U O F I N D I A N S T A N D A R D S
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2

December 1987

Indian Standard

SPECIFICATION FOR ELECTRICAL RELAYS FOR POWER SYSTEM PROTECTION

PART 1 GENERAL REQUIREMENTS

Section 1 Contact Performance

(First Revision)

Relays Sectional Committee, ETDC 35

Chairman	*Representing*
Shri N. Nath	English Electric Co of India Ltd, Madras
Members	
Shri T. V. G. Menon (*Alternate* to Shri N. Nath)	
Shri R. D. Batra	Hindustan Steel Ltd, Ranchi
Shri G. K. Saraf (*Alternate*)	
Shri R. C. Bhatia	Delhi Electric Supply Undertaking, New Delhi
Shri M. K. Chaudhary (*Alternate*)	
Shri T. B. Chikkoba	Tamil Nadu Electricity Board, Madras
Shri V. V. Sampath (*Alternate*)	
Deputy Director (PSI-II)	Railway Board, New Delhi
Deputy Director, S & T (*Alternate*)	
Director (CIP)	Central Electricity Authority, New Delhi
Shri K. L. Garg	Directorate General of Supplies & Disposals (Inspection Wing), New Delhi
Shri S. Krishna (*Alternate*)	
Shri S. G. Karadkar	Bombay Electric Supply & Transport Undertaking, Bombay
Shri M. A. Karim (*Alternate*)	
Shri V. S. Kaushikkar	Larsen & Toubro Ltd, Bombay
Shri Devender Nath (*Alternate*)	
Shri G. K. Malviya	Universal Electrics Ltd, 24 Parganas
Shri C. Ghosh (*Alternate*)	
Shri B. C. Mukherjee	National Test House, Calcutta
Shri D. P. Mukherjee (*Alternate*)	
Shri Nachhatter Singh	Bharat Heavy Electricals Ltd
Shri R. Ramasubbaiah (*Alternate* I)	
Shri S. G. Deshpande (*Alternate* II)	

(*Continued on page* 2)

© *Copyright* 1987
BUREAU OF INDIAN STANDARDS
This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(*Continued from page* 1)

Members	*Representing*
SHRI A. A. PAUL	Tata Consulting Engineers, Bombay
SHRI P. P. KARHADE (*Alternate*)	
SHRI A. K. RAJA	University of Roorkee, Roorkee
SHRI U. V. RAO	Hindustan Brown Boveri Ltd, Vadodara
SHRI P. U. BHAT (*Alternate*)	
SHRI A. M. SAHNI	Tata Hydro-Electric Power Supply Co Ltd, Bombay
SHRI V. S. DORAI (*Alternate*)	
DR M. T. SANT	ASEA Ltd, Bombay
SHRI B. S. PALKI (*Alternate*)	
SHRI B. S. SHARMA	UP State Electricity Board, Lucknow
SHRI C. P. GUPTA (*Alternate*)	
SHRI S. SIVASUBRAMANIAN	Directorate General of Technical Development, New Delhi
SHRI P. K. HALDAR (*Alternate*)	
SUPERINTENDING ENGINEER, HSEB, JIND	Haryana State Electricity Board, Chandigarh
SHRI HARNARINDER SINGH (*Alternate*)	
SHRI S. P. SURI	National Physical Laboratory (CSIR), New Delhi
SHRI S. C. GARG (*Alternate*)	
SHRI G. N. THADANI	Engineers India Ltd, New Delhi
SHRI S. G. GOKHALE (*Alternate*)	
DR K. K. THAKKAR	Jyoti Ltd, Vadodara
DR B. K. DASGUPTA (*Alternate*)	
SHRI B. K. VENKATESH	Karnataka Electricity Board, Bangalore
SHRI K. T. RAMASWAMI (*Alternate*)	
SHRI S. P. SACHDEV, Director (Elec tech)	Director General, BIS (*Ex-officio Member*)

Secretary

SHRI K. M. BHATIA
Joint Director (Elec tech), BIS

Panel for the Revision of IS : 3231 - 1965, ETDC 35/P 9

Convener	
SHRI B. S. SHARMA	UP State Electricity Board, Lucknow
Members	
DR B. K. DASGUPTA	Jyoti Ltd, Vadodara
SHRI H. DE	Hindustan Brown Boveri Ltd, Vadodara
DIRECTOR (CIP)	Central Electricity Authority, New Delhi
SHRI P. KASTURI	Tata Hydro-Electric Power Supply Co Ltd, Bombay
SHRI T. V. G. MENON	English Electric Co of India Ltd, Madras
SHRI A. A. PAUL	Tata Consulting Engineers, Bombay
SHRI P. P. KARHADE (*Alternate*)	
SHRI A. K. RAJA	University of Roorkee, Roorkee
DR M. T. SANT	ASEA Ltd, Bangalore
SHRI J. V. VAIDYA	Larsen & Toubro Ltd, Bombay

Indian Standard

SPECIFICATION FOR ELECTRICAL RELAYS FOR POWER SYSTEM PROTECTION

PART 1 GENERAL REQUIREMENTS

Section 1 Contact Performance

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part 1/Sec 1) (First Revision) was adopted by the Indian Standards Institution on 26 November 1986, after the draft finalized by the Relays Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 The relays are intended to protect the electrical plant and equipment against damage in case of abnormal conditions occurring in the system. Protective relays act as sensing elements and may be suitably set to operate with the required discrimination.

0.3 This standard was first published in 1965. This revision has been brought out to take into account the experience gained since then and to align with the international practices to the extent found appropriate. This part/section is one of the new revised series, general introduction to which is given in IS : 3231 (Part 0)-1986*.

The standards published in the revised series so far are:

IS : 3231 Specifications for electrical relays for power system protection:

(Part 0)-1986	General introduction and list of parts (*first revision*)
(Part 1/Sec 1)-1986	General requirements, Section 1 Contact performance (*first revision*)
(Part 1/Sec 2)-1986	General requirements, Section 2 Insulation tests (*first revision*)

---

*Specification for electrical relays for power system protection : Part 0 General introduction and list of parts (*first revision*).

(Part 1/Sec 3)-1986	General requirements, Section 3 High frequency disturbance test for static relays (*first revision*)
(Part 2/Sec 1)-1987	Requirements for principal families, Section 1 All-or-nothing relays
(Part 2/Sec 2)-1987	Requirements for principal families, Section 2 General requirements for measuring relays
(Part 3/Sec 1)-1987	Requirements for particular group of relays, Section 1 Non-specified time or independent specified time measuring relays
(Part 3/Sec 2)-1987	Requirement for particular group of relays, Section 2 Dependent specified time measuring relays
(Part 3/Sec 3)-1987	Requirement for particular group of relays, Section 3 Biased percentage differential relays

0.4 This standard is to be read in conjunction with IS : 12083 (Part 1)-1986* to which it makes the reference and supplements where the special requirements for protection relays make this necessary.

0.5 According to the classification on hierarchical basis [*see* IS : 3231 (Part 0)-1986†], this standard is a first level document.

0.6 In preparing this standard, assistance has been drawn from BS 142: Section 1.2 : 1982 'Electrical protection relays : Part 1 Information and requirements for all protection relays, Section 1.2 Specification for contact performance, issued by the British Standards Institution.

1. SCOPE

1.1 This standard (Part 1/Sec 1) specifies conditions for testing contact performance of electrical protection relays, criteria of contact failure for such relays and the assessment of performance data.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 1885 (Part 9)-1986‡ and IS : 12083 (Part 1)-1986* shall apply.

---

*Specification for electrical relays: Part 1 Contact performance.

†Specification for electrical relays for power system protection: Part 0 General introduction and list of parts (*first revision*).

‡Electrotechnical vocabulary : Part 9 Electrical relays (*first revision*).

3. STANDARD RATED VALUES

3.1 No rated values are specified. The series given in **3.2** and **3.3** are the preferred values for contact circuits of electrical protection relays.

3.2 Rated Voltages — Preferred rated voltages are as follows:

a) dc : 24, 48, 110, 125, 220 and 250 V

b) ac : $\frac{110}{\sqrt{3}}$, 110, $\frac{415}{\sqrt{3}}$ and 415 V (rms)

3.3 Rated Currents — Preferred rated currents are as given in **3.2** of IS : 12083 (Part 1)-1986*.

3.4 Frequency of Operation — Not applicable to protection relays.

3.5 Duty Factor — Not applicable to protection relays.

4. TEST CONDITIONS

4.1 The requirements for testing the contact performance of electrical protection relays shall be as specified in **4** of IS : 12083 (Part 1)-1986* with the exception of the input energizing and characteristic quantities for measuring relays as given in **4.3.2** (a). For measuring relays used for protection, these quantities shall be as specified in the appropriate electrical relay standard for mechanical endurance tests for the particular type of relay under consideration.

5. ASSESSMENT OF CONTACT PERFORMANCE

5.1 The assessment of contact performance shall be made in accordance with **5** of IS : 12083 (Part 1)-1986*, with the overriding requirement that contacts intended to perform a circuit breaker tripping function shall be capable of 1 000 rated operations.

6. PRESENTATION OF PERFORMANCE

6.1 The guidance given in **6** of IS : 12083 (Part 1)-1986* may be followed.

---

*Specification for electcrical relays : Part 1 Contact performance.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg,m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s(s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2